

(FILE 'HOME' ENTERED AT 12:39:30 ON 21 SEP 2000)

INDEX 'ABISALERTS, ABISINSIGHT, AGRICOLA, AIDSLINE, ANABSTR, AQUASCI,
BIOBUSINESS, BIOMERCE, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO,
CABA,
CANCERLIT, CAPLUS, CEABA, CEN, CIN, CONFSCI, CROPB, CROPJ, DDFB, DDFU,
DGENE, DRUGB, DRUGLAUNCH, DRUGMENOG2, ...' ENTERED AT 12:39:40 ON 21 SEP
2000

SEA URIDINE (W) PHOSPHOGALACTOSE OR UDP-GALACTOSE

59 FILE AGRICOLA
1 FILE AIDSLINE
10 FILE ANABSTR
7 FILE AQUASCI
6 FILE BIOMERCE
1 FILE BIOTECNHO
104 FILE BIOSIS
51 FILE BIOTECHABS
52 FILE BIOTECHDS
247 FILE BIOTECHNC
171 FILE CABA
31 FILE CANCERLIT
131 FILE CAPLUS
6 FILE CEABA
1 FILE CEN
45 FILE CONFSCI
3 FILE CROPJ
67 FILE DDFB
6 FILE DDFU
44 FILE MEDLINE
77 FILE DRUGB
11 FILE DRUGJ
1 FILE EMBAL
162 FILE EMBASE
134 FILE EMBIOBASE
17 FILE EP-OSTI
16 FILE EUSTA
39 FILE GENBANK
11 FILE IFIPAT
45 FILE JGST-EPLUS
219 FILE LIFESCI
640 FILE MEDLINE
1 FILE NTIC
3 FILE O-PAN
1 FILE EPCMT
501 FILE SCISEARCH
70 FILE TOXLINER
240 FILE TX-MILIT
119 FILE UNPATFULL
22 FILE WIIDS
32 FILE WFINDEX

L1 QUE URIDINE W) PHOSPHOGALACTOSE OR UDP-GALACTOSE

FILE 'MEDLINE, EMBASE, SCISEARCH, BIOSIS, CAPLUS, TOXLIT, CANCERLIT'
ENTERED AT 12:41:47 ON 21 SEP 2000

L2 2713 S L1 AND (SYNTHESIS OR BIOSYNTHES? OR PROCESS OR PRODUC?)
L3 15 S L2 AND MORYNEBACTERIUM
L4 6 DUP REM L3 (9 DUPLICATES REMOVED)

2020 RELEASE UNDER E.O. 14176

LA ANSWER 1 OF 6 CAPLUS COPYRIGHT 2000 ACS
ACCESSION NUMBER: WO00051686 CAPLUS
DOCUMENT NUMBER: 163:5168
TITLE: Low cost enzymatic biosynthesis of oligosaccharides
INVENTOR(S): Defreys, Shawn; Johnson, Karl
PATENT ASSIGNEE(S): Neose Technologies, Inc., USA
SOURCE: PCT Int. Appl., 103 pp.
CODEN: PIKKED
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|-----------------------|---|----------|-----------------|----------|
| WO 2000019603 | A2 | 20000516 | WO 1999-US27599 | 19991118 |
| W: | AE, AL, AM, AT, AU, AZ, BA, BB, BG, BF, BY, CA, CH, CN, CR, CU, DE, DK, DM, EE, ES, FI, GB, GE, GH, GM, HE, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, ND, NJ, PL, PT, RO, RU, SE, SE, SG, SI, SK, SL, TJ, TM, TF, TT, UA, US, US, UD, VN, YU, ZA, ZW, AM, AS, BY, EG, KG, MD, RU, TJ, TM | | | |
| RW: | GH, GM, KE, LS, MW, SD, SL, SS, TZ, US, SW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GP, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GU, GW, ML, MR, NE, SN, TD, TG | | | |
| PFICRITY APPN. INFO.: | | | US 1998-109031 | 19981118 |
| | | | US 1998-109096 | 19981119 |

AE This invention provides recombinant cells, reaction mixts., and methods for the enzymic synthesis of saccharides. The recombinant cells contain a heterologous gene that encodes a glycosyltransferase which catalyzes at least one step of the enzymic synthesis, as well a system for generating a nucleotide sugar that can serve as a substrate for

the glycosyltransferase. The nucleotide sugar may be supplied or synthesized by an enzymic pathway comprising a sugar nucleotide regeneration cycle. The reaction mixt. may contain a second cell type producing a nucleotide as a substrate for the sugar nucleotide regeneration cycle, preferably by a nucleotide synthase gene. Use of fusion proteins of glycosyltransferase and nucleotide sugar synthase combined with the use of an enzyme for substrate sugar synthesis is described. Chem. or enzymic sulfation may be used for the synthesis of sulfated sugars. The recombinant cells, reaction mixts., and methods are useful for efficiently synthesizing a large variety of saccharides, including polysaccharides, oligosaccharides, glycoproteins and glycolipids, using relatively low-cost starting materials. Synthesis of β -sialyl lactose using *E. coli* expressing a CMP-sialic acid synthetase/.alpha.2,3-sialyltransferase fusion protein is described. Optional use of bakers yeast to produce CTP used in the sialic acid cycle and substrate for CMP-sialic acid synthetase is also described. Synthesis of β -sialyl lactose using *E. coli* expressing a CMP-sialic acid synthetase /.alpha.2,3-sialyltransferase fusion protein, GlcNAc 2'-epimerase, and sialic acid aldolase to synthesize CMP-sialic acid from GlcNAc is also described. Variations of the method using *Corynebacterium* expressing a CMP-sialic acid synthetase /.alpha.2,3-sialyltransferase

fusion protein and CTP-synthetase to produce the nucleotide, nucleotide sugar, catalyzing sugar transfer to acceptor saccharide is described. Finally, synthesis of trisaccharide Gal.alpha.1,3Gal.beta.1,4GlcNAc using **Corynebacterium** expressing UDP-glucose pyrophosphorylase, UDP-glucose-4'-epimerase, .beta.1,4-galactosyltransferase, and .alpha.1,3-galactosyltransferase is described.

L4 ANSWER 2 OF 6 SISSEARCH COPYRIGHT 2000 ISI (R)

ACCESSION NUMBER: A911421741 SISSEARCH

THE GENUINE ARTICLE: 1413E

TITLE: Cloning and expression of beta 1,4-galactosyltransferase gene from *Helicobacter pylori*

AUTHOR: Endo T (Reprint); Kojimura S; Tabata K; Ozaki A

CORPORATE SOURCE: KYOWA HAKKO KOGYO CO LTD, TOKYO RES LABS, 3-6-6 ASAHI MACHI, TOKYO 144-8533, JAPAN (Reprint)

COUNTRY OF AUTHOR: JAPAN

SOURCE: GLYCobiology, (AUG 2000) Vol. 10, No. 8, pp. 809-813. Publisher: OXFORD UNIV PRESS, GREAT CLAPENDON ST, OXFORD OX2 6DP, ENGLAND.

ISSN: 0889-6565.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: LIFE

LANGUAGE: English

REFERENCE COUNT: 1

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB *Helicobacter pylori*, which is a human pathogen associated with gastric and duodenal ulcer, has been shown to express human oncofetal antigens Lewis X and Lewis Y. Although the mammalian glycosyltransferases that synthesize these structures are well characterized, little is known about the corresponding bacterial enzymes. We report that a novel beta 1,4-galactosyltransferase gene (*HpgalT*) involved in the biosynthesis of lipopolysaccharides in *H.pylori* has been cloned and expressed in *Escherichia coli*. The deduced amino acid sequence of the protein (*HpGal-T*, encoded by *HpgalT*) consists of 274 residues with the calculated molecular mass of 31,731 Da, which does not show significant similarity to those of beta 1,4-galactosyltransferases from mammalian sources and *Neisseria*. It was confirmed that *HpGal-T* catalyzed the introduction of galactose from UDP-Gal in a beta 1,4 linkage to accepting

N-acetylglucosamine (GlcNAc) residues by means of high-performance anion-exchange chromatography with pulsed amperometric detection (HPAEC-PAD). When the *E.coli* cells which overexpressed *HpgalT* was coupled with the UDP-Gal production system, which consisted of recombinant *E.coli* cells overexpressing its UDP-Gal biosynthetic genes and **Corynebacterium ammoniagenes**, N-acetyl-lactosamine, a core structure of lipopolysaccharide of *H.pylori*, was efficiently produced from ornithic acid, galactose, and GlcNAc.

L4 ANSWER 3 OF 6 MEDLINE

ACCESSION NUMBER: 129349081 MEDLINE

DOCUMENT NUMBER: 93049081

TITLE: Large-scale production of N-acetyl-lactosamine through bacterial coupling.

AUTHOR: Endo T; Kojimura S; Tabata K; Kakita S; Ozaki A

CORPORATE SOURCE: Tokyo Research Laboratories, Kyowa Hakko Kogyo Co., Ltd., Japan. enig.tetsu@kyowa.co.jp

SOURCE: CARBOHYDRATE RESEARCH, 1991 Mar 31) 316 (1-4) 179-83. Journal code: CNY. ISSN: 0008-6215.

PUB. COUNTRY: Netherlands

LANGUAGE: English

FILE SEGMENT: Priority Journals

ENTRY MONTH: 1991

ENTRY WEEK: 1991302

AB A large-scale production system of N-acetyllactosamine, a core structure of various oligosaccharides, was established by a whole-cell reaction through the combination of recombinant *Escherichia coli* strains and *Corynebacterium ammoniagenes*. Two recombinant *E. coli* strain over-expressed the UDP-Gal biosynthetic genes and the beta-(1-->4)-galactosyltransferase gene of *Neisseria gonorrhoeae*, respectively. *C. ammoniagenes* contributed the production of UTP from orotic acid. N-Acetyllactosamine was accumulated at 279 mM (107 g L⁻¹) after a 38 h reaction (1.5 L in volume) starting from orotic acid, D-galactose, and 2-amino-2-deoxy-D-glucose.

L4 ANSWER 4 OF 6 CAPLUS COPYRIGHT 2000 ACS
 ACCESSION NUMBER: 1998:197631 CAPLUS
 DOCUMENT NUMBER: 135:356413
 TITLE: Processes for producing sugar nucleotides and complex carbohydrates
 INVENTOR(S): Hoizumi, Satoshi; Sasaki, Katsutoshi; Endo, Tetsuo;
 Tabata, Kazuhiko; Ozaki, Akio
 PATENT ASSIGNEE(S): Kyowa Hakko Kogyo Co., Ltd., Japan; Hoizumi, Satoshi;
 Sasaki, Katsutoshi; Endo, Tetsuo; Tabata, Kazuhiko;
 Ozaki, Akio
 SOURCE: PCT Int. Appl., 119 pp.
 COUNTRY: PCTINT
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|----------|
| WO 9611343 | A1 | 19960316 | WO 1997-03226 | 19970312 |
| W: AU, BG, BR, CA, CN, DE, HK, JP, KE, MX, ND, NZ, PL, RO, SG, SI, SK, UA, US, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: AT, BE, CH, DE, DK, ES, FI, FR, GR, IE, IT, LU, MC, NL, PT, SE | | | | |
| CA 2237849 | AA | 19960316 | CA 1997-037649 | 19970312 |
| AU 9741263 | A1 | 19960414 | A1 1997-042293 | 19970312 |
| EP 970841 | A1 | 19961014 | EP 1997-040361 | 19970312 |
| E: AT, BE, CH, DE, DK, ES, FI, FR, GB, SE, IT, LI, LU, NL, SE, MC, PT, IE, FI | | | | |
| CN 1171155 | A | 1996.03 | CN 1997-121696 | 19970312 |
| PRIORITY APPLIC. INFO.: | | | JP 1996-144451 | 19960917 |
| | | | JP 1996-145606 | 19961028 |
| | | | WO 1997-037649 | 19970312 |

AB Sugar nucleotides are manufd. with microorganism or enzyme producing NTP from nucleotide precursor and with microorganism or enzyme producing sugar nucleotides from sugar and NTP. Complex carbohydrates are manufd. with the described microorganism/enzyme and microorganism/enzyme that produces complex carbohydrates from sugar nucleotide and complex carbohydrate precursor. Also given was prodn. of N-acetylglucosamine-1-phosphate with galactokinase-high microorganism.

L4 ANSWER 5 OF 6 MEDLINE
 ACCESSION NUMBER: 1998414056 MEDLINE
 DOCUMENT NUMBER: 08414050
 TITLE: Large-scale production of UDP-galactose and globotriose by coupling metabolically engineered bacteria.
 AUTHOR: Hoizumi S; Endo T; Tabata K; Ozaki A
 CORPORATE SOURCE: Tokyo Research Laboratories, Kyowa Hakko Kogyo Co., Ltd., Machida, Japan.. hoizumi@kyowa.co.jp
 SOURCE: NATURE BIOTECHNOLOGY, (1998 Sep; 16 (9): 847-50.
 JOURNAL CODE: CQ3. ISSN: 1087-0196.
 PUB. COUNTRY: United States
 JOURNAL; Article; JOURNAL ARTICLE)

DUPLICATE 1

LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199901
ENTRY WEEK: 19990104

AB A large-scale **production** system of uridine 5'-diphospho-galactose (UDP-Gal) has been established by the combination of recombinant

Escherichia coli and **Corynebacterium** ammoniagenes. Recombinant *E. coli* that overexpress the UDP-Gal **biosynthetic** genes galT, galF, and galU were generated. *C. ammoniagenes* contribute the **production** of uridine triphosphate (UTP), a substrate for UDP-Gal **biosynthesis**, from orotic acid, an inexpensive precursor of UTP. UDP-Gal accumulated to 72 mM (44 µg/L) after a 21 h reaction starting with orotic acid and galactose. When *E. coli* cells that expressed the *alpha*1,4-galactosyltransferase gene of *Neisseria gonorrhoeae* were coupled with this UDP-Gal **production** system, 372 mM (188 g/L) globotriose (Galα1,4Galβ1-4Glc), a trisaccharide portion of verotoxin receptor, was **produced** after a 36 h reaction starting with orotic acid, galactose, and lactose. No oligosaccharide **by-products** were observed in the reaction mixture. The **production** of globotriose was several times higher than that of UDP-Gal. The strategy of **producing** sugar nucleotides by combining metabolically engineered recombinant *E. coli* with a nucleoside 5'-triphosphate **producing** microorganism, and the concept of **producing** oligosaccharides by coupling sugar nucleotide **production** systems with glycosyltransferases, can be applied to the manufacture of other sugar nucleotides and oligosaccharides.

L4 ANSWER 6 OF 6 MELLINE DUPLICATE :
ACCESSION NUMBER: 5718050A MELLINE
DOCUMENT NUMBER: 5718050B
TITLE: The *galE* gene encoding the **UDP-galactose** 4-epimerase of *Brevibacterium lactofermentum* is coupled transcriptionally to the *dmddF* gene.
AUTHOR: Cugina J A; Marcos A T; Malumbres M; Martin J F
CORPORATE SOURCE: Department of Biology, Genetics and Microbiology, Faculty of Biology, University of Leon, Spain.
SOURCE: GENE, (1996 Oct 14; 197(1-2): 193-7).
JOURNAL CODE: P-P. ISSN: 0378-1113.
PUB. COUNTRY: Netherlands
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-S44613
ENTRY MONTH: 199701

AB The *galE* gene of *Brevibacterium lactofermentum*, encoding **UDP-galactose** 4-epimerase (EC 5.1.3.3), has been identified by DNA sequencing downstream from the *crf1-sigB-dmddF* region. The arrangement of the *sigB-dtxR-galE* cluster is also conserved in **Corynebacterium diphtheriae**. The deduced *galE* **product** was a protein of 329 aa residues (35.4 kDa) that shared a high degree of identity to known **UDP-galactose** 4-epimerase proteins from Gram-positive microorganisms (*Streptomyces lividans* and *Streptococcus thermophilus*). Transcriptional analysis of the *dmddF* and *galE* genes in nutrient-rich medium showed that these genes are part of an operon, that is actively transcribed as a bicistronic mRNA during the exponential growth phase, but

transcription of the operon is decreased during the stationary growth phase. In addition, the *dmddF* gene was also expressed as a monocistronic 0.7-kb transcript during the active growth phase.

=> d his

L11 ANSWER 37 OF 42 TOXLIT

ACCESSION NUMBER: 1990:98326 TOXLIT

DOCUMENT NUMBER: CA-113-206233P

TITLE: Cloning and expression of **cDNA** for human membrane-bound beta-1,4-galactosyltransferase.

AUTHOR: Fukuda MN; Appert HA

SOURCE: (1990). PCT Int. Appl. PATENT NO. 90 07000 06/28/90 (La Jolla Cancer Research Foundation).

PUB. COUNTRY: United States

DOCUMENT TYPE: Patent

FILE SEGMENT: CA

LANGUAGE: English

OTHER SOURCE: CA 113:206233

ENTRY MONTH: 199012

AB A full-length **cDNA** encoding the membrane-bound form of beta-1,4-galactosyltransferase from human Golgi bodies is cloned and expressed in Escherichia **coli** and antibodies raised to peptides from the protein. The enzyme is involved in post-translational modification of proteins and there are pathol. consequences from deficiencies in the enzyme (congenital dyserythropoietic anemia type II). The full-length **cDNA** was constructed from a pair of overlapping clones from a human placental **cDNA** library in lambda gt11 and expressed in E. **coli** using pIN-III-ompA3 as the expression vector. Antibodies to a peptide from the carboxy-terminal region of the protein were raised in rabbits by conventional methods.

L11 ANSWER 39 OF 42 CAPLUS COPYRIGHT 2000 ACS
ACCESSION NUMBER: 1991:1540 CAPLUS
DOCUMENT NUMBER: 114:1540
TITLE: Sequence of a **cDNA** encoding human
galactose-1-phosphate uridyl transferase
AUTHOR(S): Flach, James E.; Reichardt, Juergen K. V.; Elsas,
Louis J., II
CORPORATE SOURCE: Dep. Pediatr., Emory Univ., Atlanta, GA, 30322, USA
SOURCE: Mol. Biol. Med. (1990), 7(4), 365-9
CODEN: MBIMDG; ISSN: 0735-1313
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A revised sequence of a **cDNA** that encodes a human
galactose-1-phosphate uridyl transferase is reported here. The
cDNA is 1295 bases in length and encodes a 43,000 Mr protein. The
sequence was derived from a **cDNA** clone isolated from a
transformed human lymphoblast cell line and amplified in a polymerase
chain reaction. The revised sequence reveals a higher degree of amino
acid conservation between the human enzyme and the homologous enzymes
from
Escherichia **coli** and yeast than was previously thought to exist.

[Help](#)[Logout](#)[Interrupt](#)[Main Menu](#)[Search Form](#)[Posting Counts](#)[Show S Numbers](#)[Edit S Numbers](#)[Preferences](#)**Search Results -**

| Terms | Documents |
|-------------------------|-----------|
| L11 and Corynebacterium | 2 |

US Patents Full-Text Database



JPO Abstracts Database

EPO Abstracts Database

Derwent World Patents Index

Database: IBM Technical Disclosure Bulletins



L11 and Corynebacterium

[Clear](#)[Refine Search:](#)**Search History**

Today's Date: 9/21/2000

| DB Name | Query | Hit Count | Set Name |
|---------------------|--|-----------|------------|
| USPT,JPAB,EPAB,DWPI | L11 and Corynebacterium | 2 | <u>L13</u> |
| USPT,JPAB,EPAB,DWPI | L11 and Corynebacterium | 2 | <u>L12</u> |
| USPT,JPAB,EPAB,DWPI | L4 and galactose | 87 | <u>L11</u> |
| USPT | 4296203.pn. | 1 | <u>L10</u> |
| USPT | 5516665.pn. | 1 | <u>L9</u> |
| USPT | 5409817.pn. | 1 | <u>L8</u> |
| USPT,JPAB,EPAB,DWPI | L5 and orotic acid | 0 | <u>L7</u> |
| USPT,JPAB,EPAB,DWPI | L2 and orotic acid | 1 | <u>L6</u> |
| USPT,JPAB,EPAB,DWPI | L2 and galactose | 67 | <u>L5</u> |
| USPT,JPAB,EPAB,DWPI | L1 and orotic adj acid | 378 | <u>L4</u> |
| USPT,JPAB,EPAB,DWPI | L1 and orotic adj acid | 378 | <u>L3</u> |
| USPT,JPAB,EPAB,DWPI | L1 and (sugar adj nucleotide) | 185 | <u>L2</u> |
| USPT,JPAB,EPAB,DWPI | synthesis OR biosynthesis OR product? Or process? same (sugar adj nucleotide) | 925064 | <u>L1</u> |

[Help](#) | [Logout](#) | [Interrupt](#)[Main Menu](#) | [Search Form](#) | [Posting Counts](#) | [Show S Numbers](#) | [Edit S Numbers](#) | [Preferences](#)**Search Results -**

| Terms | Documents |
|------------------------|-----------|
| Corynebacterium and l3 | 4 |

US Patents Full-Text Database
JPO Abstracts Database
EPO Abstracts Database
Derwent World Patents Index
Database: IBM Technical Disclosure Bulletins

Corynebacterium and 13

[Refine Search:](#)[Clear](#)**Search History**

Today's Date: 9/21/2000

| <u>DB Name</u> | <u>Query</u> | <u>Hit Count</u> | <u>Set Name</u> |
|---------------------|--|------------------|-----------------|
| USPT,JPAB,EPAB,DWPI | Corynebacterium and l3 | 4 | <u>L6</u> |
| USPT,JPAB,EPAB,DWPI | synthesis OR biosynthesis same l3 | 252198 | <u>L5</u> |
| USPT,JPAB,EPAB,DWPI | (Prepara? OR Process or making or manufacture) same l3 | 7 | <u>L4</u> |
| USPT,JPAB,EPAB,DWPI | UDP-galactose | 121 | <u>L3</u> |
| USPT,JPAB,EPAB,DWPI | phosphogalactose | 4 | <u>L2</u> |
| USPT,JPAB,EPAB,DWPI | (uridine adj phosphogalactose) OR (Uridine adj phosphoglucose) | 0 | <u>L1</u> |